

PETRIFIED FOREST

National Monument

ARIZONA



UNITED STATES RAILROAD ADMINISTRATION
NATIONAL PARK SERIES



An Appreciation of The Petrified Forest of Arizona

By CHAS. F. LUMMIS

Author of "Some Strange Corners of Our Country,"—"The Land of Poco Tiempo,"
"Pueblo Indian Folk Stories," etc.

Written Especially for the United States Railroad Administration

"Full fathom five thy father lies;
Of his bones are coral made;
Those are pearls that were his eyes;
Nothing of him that doth fade,
But doth suffer a sea-change
Into something rich and strange."

—*The Tempest.*



SEQUOIA in California is the oldest creature alive. It had measured a millennium when Christ walked the earth. But "that's no time at all." Ten thousand ages before the cedars bloomed on Lebanon, away out here in the Wonderland of our own Southwest, the

"Wind, that grand old harper, smote
His thunder-harp of pines"—

identical pines that are with us to this day. Not, indeed, as they were in that incalculable Past—for they have Put on Immortality, and are this side of Resurrection. They lived their green millenniums, and were laid to bed under the coverlet of a continent, to sleep ten times as long as Parasite Man has crawled upon this globe. And since, for as many aeons, the tireless moths of Erosion have been gnawing away their league-thick blankets, till at last they are bared again to the Arizona sun—the most imperishable of earthly things, and of fadeless beauty; a "Forest" in Glorified Stone, its very bark and "rings" immortalized in agate.

Not as that classic Munchausen of the Grand Canyon, Cap'n John Hance, loved to tell. "A forest of petrified trees, with petrified birds flying through petrified air, singing petrified songs"—but prostrate and unmurmuring trunks upon a stark desert bed.

How great was once this grove of giant conifers and willow-kind, no man will ever know—nor how much is still buried, where ancient lava flows have pinned its sedimentary blankets down. Some 400,000 acres of it are uncovered—in extent and beauty the noblest petrified forest in the world. Only the diamond is harder than its "wood;" only the opal so rainbowed. Some cosmic cataclysm mowed it down, orderly and at a scythe-swing. Not cyclone nor freshet—Noah's flood turned against it could not have felled it so fair. It is no tangle of windfall or flotsam. Swath by swath it fell, its lofty tops generally to the south. Perhaps a far vaster earthquake than later split the Mogollon plateau to the beginnings of the Grand Canyon was the agent.

Anyhow, before it could decay, the prostrate forest was submerged beneath some gentle sea, whose boiling mineral springs and slow-building sediments "pickled" it forever, under the inconceivable pressure of two vertical miles of strata—even as we pygmies today creosote piles and railroad ties under the inverse thrust of a vacuum. As agate to pine for hardness, as aeons to weeks for duration, as gems to mud for beauty—so was God's "pickling" to ours.

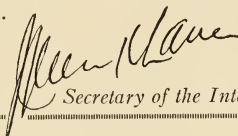
As unhurried of the Ages, this submerged half-continent was then exalted from three miles below its miracle-working sea to three miles above it—so evenly that its stratum blankets were hardly rumpled; and the patient Weather began its task. Grain by slow grain, the sandstones resolved to sand again, and found their way to be laid down under later seas to form some future continent. Upon these one-time tropics had crept the Age of Ice; and crept back toward the Pole: and had been forgotten. As dwindling snow lets down a twig imperceptibly, so when their stone coverlet—"9000 ft. thick on the average" (Drake), had melted to Erosion, the great fossil logs sank with their sinking shales and clays. They are still a mile above the sea. In their subsidence they have broken their backbones squarely, almost into vertebrae; few sections are 20 feet long—though some trees were once 240 feet tall (and still so measure upon the ground) and nine feet diameter. A 150-foot log, the "petrified bridge," spans a ravine between rock piers. The glittering "chips," like fossil butterflies, pave hundreds of square miles, and were "the first money in America." Ages before Columbus, these chips of agate and chalcedony were prized by the First Americans—to make the best arrowheads and "knives" that primitive man ever fashioned. Prehistoric Indian pueblos, whose ruins we explore today on surviving cliffs 500 feet above, controlled this aboriginal "hardware shop," and bartered its bright spalls a thousand miles either way, for the guacamayo plumes of Yucatan to the bison hides of the Plains, and the shells of the California Gulf.

In our own day we have sometimes sawed these logs (with the only harder substance, diamond-dust) into 36-inch table-tops, at \$2500 each; but it is too costly to polish commercially. One company tried grinding it for emery. Hundreds of these "gem" logs have been dynamited to get the crystals in hollow cores. I have a piece not three inches across; with a quartz heart, and on one side half-inch crystals of amethyst, and on the other their mates in smoky topaz. But in 1906 the Petrified Forest was made a National Monument and saved from the "civilized savage." The railroad traversed it in 1882; and it is now easy of access. North is the Black Forest, some of whose great stumps still stand erect, their futile roots bedded in the wasting clays. The Southwest Museum in Los Angeles has the unique terminal bud of one of those giant *Sagillarias*. South are the Rainbow, the Crystal, the Blue and other "forests" of the Forest—second only to the Grand Canyon as a chief wonder of the Southwestern Wonderland.

Chas. F. Sumner

To the American People:

Uncle Sam asks you to be his guest. He has prepared for you the choice places of this continent—places of grandeur, beauty and of wonder. He has built roads through the deep-cut canyons and beside happy streams, which will carry you into these places in comfort, and has provided lodgings and food in the most distant and inaccessible places that you might enjoy yourself and realize as little as possible the rigors of the pioneer traveler's life. These are for you. They are the playgrounds of the people. To see them is to make more hearty your affection and admiration for America.


Secretary of the Interior

Petrified Forest National Monument



O subject is of deeper interest, to educator and casual tourist alike, than the history of the earth on which we live, and the wonders thereof. Particularly that portion which we call America.

The earth itself—our own land—how did it first awake? In the descriptions that follow you will find a brief account of the earth-making process as revealed to us by a study of the Petrified Forest of Arizona in the light of modern scientific research.

In this wonderful region you will find beneath turquoise skies pillars and bridges of agate and chalcedony and every roadway strewn with gems that might adorn the palaces of Golconda or the temples of Ormus.

Long ere the pithecanthropus exchanged his arboreal dwelling for a cave, or Noah and his family fled from a bankrupt world—even ere Adam was—forests were growing in Arizona. In the course of ages some cosmic catastrophe struck them down and over them swept an inland sea, whose sediments subsequently

buried them a mile or more deep. During these long geologic periods, the subtle alchemy of Nature perfected its transmutation. Riven and fractured, the ancient logs were again brought upward, and after years of erosion they were once more “living” under the brilliant Arizona skies—not as they once lived, but in a glowing permanent form. They are there today, the most brilliant aggregation of jewels on the globe. There are agates, chalcedony, jasper, onyx and opals not by the handful, but by the ton.

And these beautiful mosaics lie in the open air, scattered over thousands of acres, on the great Southwestern Plateau, with its colorful deserts, its lofty extinct volcanoes whose iridescent hues are reborn and die each day under the magic of the sunlight, with its vast lava fields, its fascinating ruins of a prehistoric people and its equally interesting pueblos of their descendants.

The building of the railroad first brought into prominence this wonderful natural phenomena. Many scientists visited the region and made reports to the authorities in Washington, from time



A natural bridge of agatized wood

to time. Even as late as 1906, a new forest, the North Sigillaria, was discovered by John Muir, the noted California naturalist.

The following letter was written in 1899 by the acting Secretary of the Smithsonian Institute, in response to an inquiry:

"The region in Apache County, Arizona, known as the 'Petrified Forest,' 'Chalcedony Park,' and 'Lithodendron (stone trees) Valley,' is of great interest because of the abundance of its beautiful petrified coniferous trees, as well as for its scenic features. The trees lie scattered about in great profusion, but none stand erect in their original place of growth, as do many in the Yellowstone National Park. The National Museum possesses three splendid trunks, collected there at the request of General Sherman."

A good account of this locality by Mr. Geo. F. Kunz, is in part as follows:

"Among the great American wonders is the silicified forest known as Chalcedony Park, (now Petrified Forest National Monument), in Apache County,

Arizona. There is every evidence that the trees grew beside some inland sea. After falling they became water-logged, and during decomposition the cell structure of the wood was entirely replaced by silica from sandstone in the walls surrounding this great sea."

"Over the entire area, trees lie scattered in all conceivable positions and in fragments of all sizes, the broken sections sometimes resembling a pile of cart wheels. A phenomenon perhaps unparalleled, and the most remarkable feature of the park, is a natural bridge, formed by a tree of agatized wood spanning a canyon 60 feet in width. In addition to this span, fully fifty feet of the tree rests on one side making a visible length of over 100 feet."

Dr. Walter Hough, of the Smithsonian Institute, writes as follows:

"In the celebrated Petrified Forest, Arizona, there are ruins of several Indian Villages. These villages are small, in some cases have merely a few houses, but what gives them peculiar interest is that they are built of logs of

beautiful fossil wood. The prehistoric dwellers of the land selected cylinders of uniform size, which were seemingly determined by the carrying strength of a man (or several men). It is probable that prehistoric builders never chose more beautiful stones for their habitations, than the trunks of these trees which flourished ages before man appeared on earth."

"This wood agate also furnished material for stone hammers, arrowheads and knives, which are often found in ruins hundreds of miles from the forest. The 'wood agate,' or 'wood opal' is now cut and polished into floor tiling, mantels, clock cases, table tops, etc. The silver testimonial to the French sculptor Bartholdi, made by Tiffany & Co., had for its base a section of this wood agate."

As a result of the scientific investigations and reports, the growing interest of the public, and to end the depredations of vandals, activity in Congress led at length to the passage of the Act of June 8, 1906, entitled "An Act for the Preservation of American Antiquities," and to

President Roosevelt's proclamation of December 8, 1906, which, under the name of The Petrified Forest National Monument, placed the forest under the protection of the Government for the perpetual enjoyment of the people. Area, 25,625 acres.

But let us turn to the detailed description of one who has made a careful, scientific study of the region.

The following is from the report of Prof. Lester F. Ward, Paleontologist, U. S. Geological Survey:

"These Petrified Forests may be properly classed among the natural wonders of America, and every reasonable effort should be made not only to preserve them from destructive influences but also to make their existence and true character known to the people."

"Some of the most important considerations that may be urged in favor of the importance of this region compared with other petrified forests rest upon its geological relations. It is much more ancient than those of the Yellowstone National Park, of certain parts of Wyo-



The plain is cut into innumerable ridges, buttes and mesas



The petrified logs are countless and lie in great profusion on knolls, buttes and spurs

ming, and of the Calistoga deposits in California. The difference in their antiquity is many millions of years. There is no other petrified forest in which the wood assumes so many varied colors, and it is these that present the chief attraction for the general public. The state of mineralization in which much of this wood exists almost places them among the gems of precious stones. Not only are chalcedony, opals, and agates found among them, but many approach the condition of jasper and onyx. The degree of hardness attained by them is such that they are said to make an excellent quality of emery."

"This region consists of the ruins of a former plain having an altitude above sea level of 5,700 feet. This plain has undergone extensive erosion to a maximum depth of nearly 700 feet, and is cut into innumerable ridges, buttes, and small mesas, with valleys, gorges, and gulches between. The strata consist of alternating beds of clays, sandstone shales, and massive sandstones. The clays are purple, white and blue, the

purple predominating, the white and blue forming bands of different thickness between the others, giving to the cliffs a lively and pleasing effect. The sandstones are chiefly of a reddish brown color. The mesas are formed by the resistance of the massive sandstone layers—of which there are several at different horizons—to erosive agencies, and vary in size from mere capstones of small buttes to tables several miles in extent, stretching to the east and to the northwest."

"The petrified logs are countless at all horizons and lie in the greatest profusion on the knolls, buttes, and spurs, and in the ravines and gulches, while the ground seems to be everywhere studded with gems, consisting of broken fragments of all shapes and sizes and exhibiting all the colors of the rainbow. When we remember that this special area is several square miles in extent some idea can be formed of the enormous quantity of this material that it contains."

"The petrified logs do not occur in the same abundance throughout. They are



A tree in the Second Forest

massed or collected together in groups or heaps at certain points, and may be altogether absent at others. From their great abundance in the above described section, it must be inferred that the stratum which holds them was especially rich, and the trunks must have lain in heaps upon one another."

"Perhaps the most prominent of all the scenic features of the region is the well known Natural Bridge, consisting of a great petrified trunk of jasper and agate, lying across a canyon 60 feet wide and 20 feet deep, and forming a foot-bridge over which anyone may easily pass. The Natural Bridge, therefore, possesses the added interest of being in place, which can be said of very few of the other petrified logs of this region."

A Description of the Forests' Divisions

The First Forest, noted for its bright colors, is distant about six miles from Adamana (altitude 5,277 feet). It is easily reached in an hour and a half. The journey may be made in a leisurely fashion, starting late in the morning and returning at dusk, with an hour enroute for inspection of the Hieroglyphic Rocks and Aztec

Ruins, and plenty of time to see the Second Forest, too. The chief object of interest is the Natural Log Bridge, which is mentioned elsewhere. The Eagle's Nest, Snow Lady and Dewey's Cannon are in this locality.

The Second Forest is two and one-half miles due south of the first one, the trip requiring thirty minutes each way. It contains about two thousand acres. The trees are mostly intact, large and many of them highly colored. The Twin Sisters are an interesting sight here.

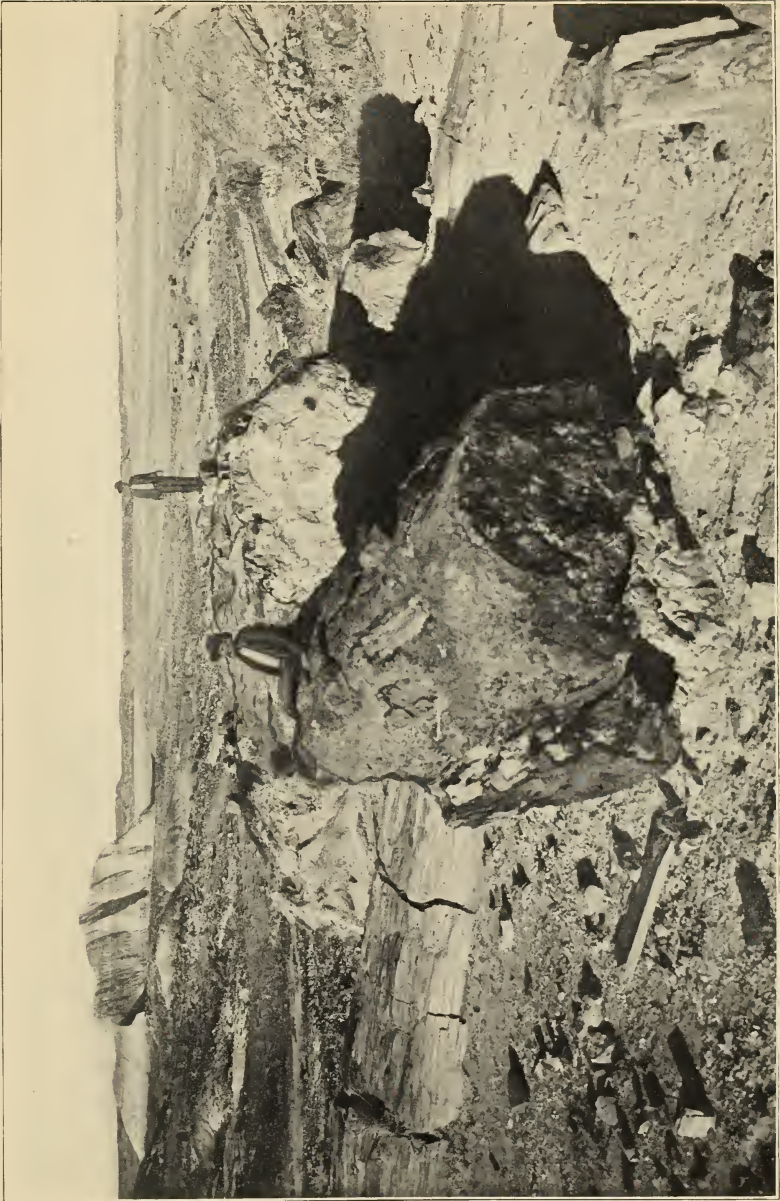
The Third Forest covers a greater area than the others. It lies thirteen miles southwest of Adamana and eighteen miles southeast of Holbrook. There are several hundred whole trees, some of them more than two hundred feet long. The colors are very striking, comprising every tint of the rainbow and therefore the local name of Rainbow Forest is very appropriate.

The Blue Forest (smallest of the five), located seven miles east of Adamana, is one of the two districts discovered by John Muir. It is noted for the blue tints of its trees.

The North Sigillaria Forest, a new "find", is nine miles north from Adamana, and contains many finely preserved specimens of the carboniferous period—some of the stumps still standing where they grew. It is located on the bottom and sides of a shallow canyon, with buttes and mesas of different colored clays and rocks. One fallen monarch is 147 feet long. A wide view of the Painted Desert may be had here and on the



Petrified tree in a stratum of sandstone



In the Third Forest



Scene in Third Forest
Page twelve

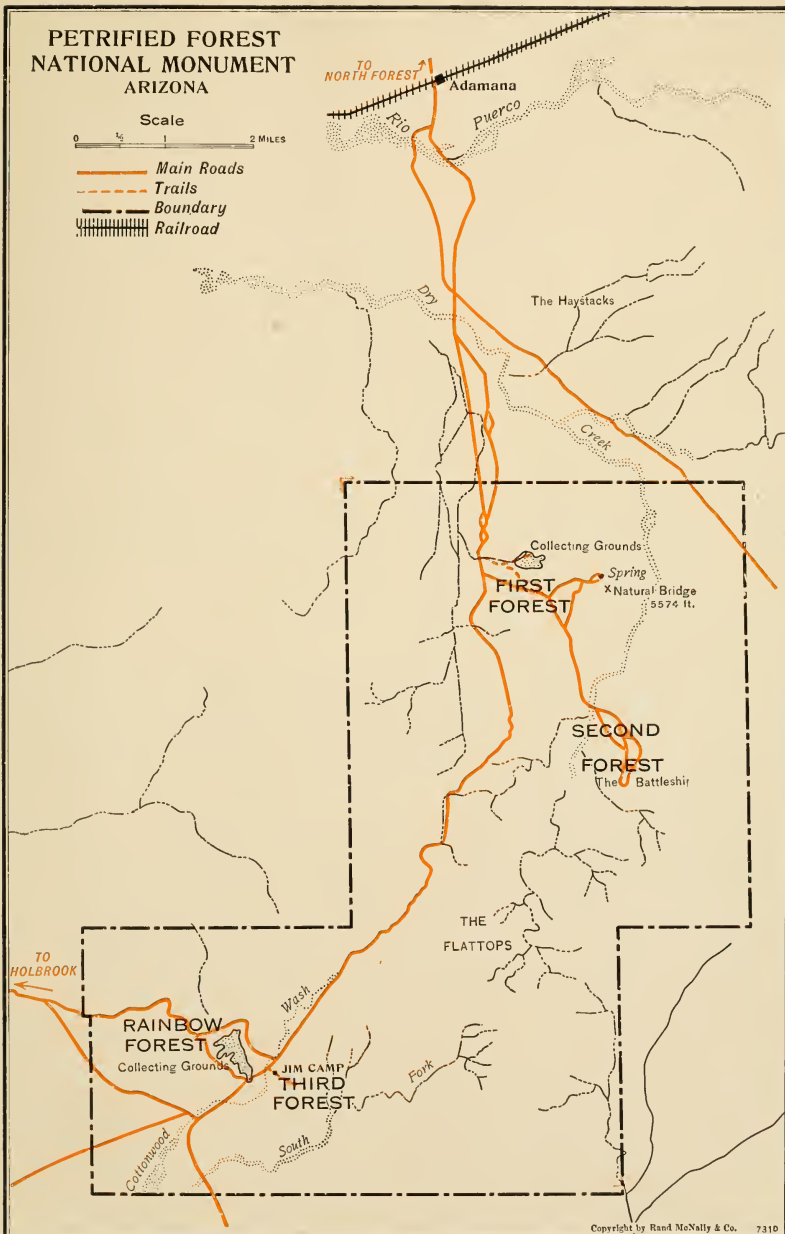
Huge tree in North Forest

Overlooking North Forest and
The Painted Desert

PETRIFIED FOREST NATIONAL MONUMENT ARIZONA

Scale
0 1 2 Miles

- Main Roads
- - - Trails
- - - Boundary
- ||||| Railroad



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way out an Indian ruin is passed. The round trip to either of the two last named Forests requires about four hours time, though if one is in a hurry, all the Forests except the Third may be visited by auto in a day's time.

Only the First, Second and Third Forests are included in the Petrified Forest National Monument.

Costs of Trips and Hotel Accommodations

Except the small hotel, railway station and store, there are few buildings at Adamana. Mr. Wm. Nelson has charge of the hotel and livery accommodations. The hotel has sanitary plumbing, with hot and cold water. Board and lodging may be had at \$3.00 per day American plan; thirty-five guests can be accommodated; in summer, tents also are provided for guests.

The round-trip fare to the First and Second Forests and Natural Bridge is \$5.00 for one person, \$3.00 per capita for two persons, and \$2.50 per capita for three or more.

To the Third, Blue or North Sigillaria Forests and Painted Desert the fare is same as to the First and Second Forests.

One of the most interesting trips from Adamana is northeast to Wide Ruins (Kin-Tiel), a Navajo trading post, built among the ruins of an Aztec village. On the way you pass Pinta, Inscription Rock, a bit of the Painted Desert and Tanner Springs, a big cattle and sheep ranch on the Navajo reservation. It is about three hours and a half by auto; \$30.00 round trip for four persons or less. If desired, this trip may be continued farther north through the Navajo country. Notice in advance to Mr. Wm. Nelson at Adamana, Arizona, owner of livery, will insure proper handling of parties.

Mr. Nelson also equips camping parties for the Hopi and Navajo Indian Reservations, and for a few days' trip into the Painted Desert.

Holbrook, the county seat town, has satisfactory hotel accommodations, with prices about the same as at Adamana.

The Petrified Forest may be visited any day in the year, except when high waters make the streams temporarily impassable.

Stop-Over Arrangements

Stop-overs are allowed at Adamana, not to exceed ten days, on all one-way tickets, also on round-trip tickets within their limits.

Stop-overs are also allowed on Pullman tickets.

To obtain stop-overs on one-way tickets, notify train conductor and deposit tickets with agent immediately after arrival; on round-trip tickets notify train conductor.

Park Administration

Petrified Forest National Monument is under the jurisdiction of the Director, National Park Service, Department of the Interior, Washington, D. C. The Monument Custodian is located at Adamana, Arizona.

U. S. Government Publications

The following publications may be obtained free on written application to the Director of the National Park Service, Washington, D. C.

Glimpses of our National Parks. 48 pages, illustrated.

Map of National Parks and National Monuments. Shows location of all the national parks and monuments, and railroad routes to these reservations.

The following publication may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at price given. Remittances should be by money order or in cash.

The National Parks Portfolio. By Robert Sterling Yard. 260 pages, 270 illustrations. Pamphlet edition, 35 cents; book edition, 55 cents. Contains nine sections, each descriptive of national park.

U. S. R. R. Administration Publications

The following publications may be obtained free on application to any consolidated ticket office; or apply to the Bureau of Service, National Parks and Monuments, or Travel Bureau—Western Lines, 646 Transportation Building, Chicago, Ill.

Arizona and New Mexico Rockies
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Hot Springs National Park, Arkansas

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Mount Rainier National Park, Washington

Northern Lakes—Wisconsin, Minnesota, Upper Michigan, Iowa and Illinois.

Pacific Northwest and Alaska

Petrified Forest National Monument, Arizona

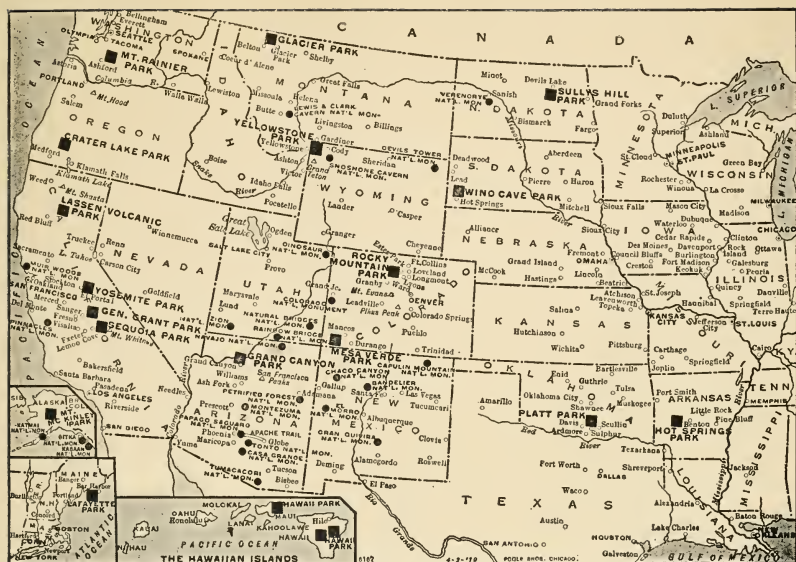
Rocky Mountain National Park, Colorado

Sequoia and General Grant National Parks, California

Yellowstone National Park, Wyoming, Montana, Idaho

Yosemite National Park, California

Zion National Monument, Utah



The National Parks at a Glance

United States Railroad Administration Director General of Railroads

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Davenport Hotel, 815 Sprague Ave.
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Charlotte, N. C., 22 S. Tryon St.
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Columbia, S. C., Arcade Building
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"And in the fullness of the ages the immortal Forest came back to the sunlight, where once its myriad leaves danced and breathed a mortal air."